

LAKE MANAGEMENT PLANS

Updated July 2006 – J. Korth

Water(s): Warden, South Warden, and Annex (Index) Lakes

Location: Seep Lakes Wildlife Area, Sec 10,11,15,16 T17N R29E; approximately 4 miles west of Warden and 5 miles southeast of the southeast corner of Potholes Reservoir, Grant County, WA

	Size:	Maximum Depth:
Warden	211 acres	70 feet
South W Warden	25 acres	30 feet
Annex Lake 1	2 acres	8 feet
Annex Lake 2	18 acres	30 feet
Shay Pond	4 acres	5 feet

Water Source: subsurface seepage springs

Outflow: 5 cfs to Lind Coulee

Management History: The Warden, South Warden, and Annex chain of lakes lie in the Seep Lakes Wildlife Area. Warden Lake is 211 acres and among the largest trout-only waters in Grant County, while the remaining waters in this system are rather small and have limited public access through agreements with the landowners. Warden Lake has been a popular trout fishery since first stocked with rainbow trout in 1954. Through the mid-1960s as many as 2,000 anglers attended the fishery on an opening day, and catch rates were as high as 7 to 9 fish per angler (Table 1). Boating access is available at Warden Lake, while anglers must walk into the remaining smaller lakes.

Seasons, regulations: Regulations have generally followed statewide rules for most of Warden Lake's history. The daily limit is currently five trout, and bait is allowed. The Annex lakes are open to angling year-round. The Warden lakes were originally on the statewide April Opening Day season. The small, state-owned access area was insufficient to handle the large crowds. Anglers roamed everywhere, including vehicles, and upland habitat suffered. In 1980 and in conjunction with many other Basin waters suffering the same habitat degradation, the opening day was changed to March 1st through July 31 in an attempt to spread out and control crowds. Weather in early March is unpredictable, and often these waters are covered with ice. Opening day crowds were indeed dissuaded; however, unfavorable weather conditions also often diminished angling success. Improved access areas and landowner agreements offered better crowd control than in the past. In 2001, the season was changed back to the statewide late-April opener (last Saturday in April through September 30) to encourage more anglers to ply their wares on Warden Lake, a complete turn around from the perceptions that instigated the March 1st opener over twenty years before. Opening day catch rates of fingerling-origin yearlings initially improved.

Table 1. Warden Lake opening day catch and effort summary: 1954 - 2005.

Year	Fish/ angler	Fish/ hour	Age 1+ average length	Age 2+ average length	Age 2+ % of catch	Total Effort (angler trips)	Total Harvest	Comments
54	First stocked with rainbow trout fry @ 100-200/lb; produced 11-12" fish.							Frank White
55-64:	no creel data. April Opener.							<u>#RB Stocked</u>
64								140K @100
65	9.0					2,013	18,237	140K @100
66	7.0					1,267	8,894	100K @8
66								Sept Rehab
67	9.0					860	7,740	82K@140
68	7.0					1,580	13,277	60K@170
69	1.0					728	750	
69								July Rehab
70-73:	no creel data							
72								80K@160
73								81K@135-160
74	7.7					186	1,426	80K@103-123
75	3.0					91	306	25K@138
76	1.5					20	35	0
77						0		20K@138
78-79:	no creel data							
80	Begin March 1 Opener with 75K@80-100 RB Stocked							April Rehab
81	1.0		12.0		0.0			
82								No data
83								No data
84	1.2		10.3	15.0	2.0			
85	2.0	0.9	10.0	13.0	?			Ice cover 80%
86	3.2		11.0		10.0			
87	1.9		10.6	15.0	9.0			Perch present
88	3.2		10.8	14.5	10.0			
89								No data
90	0.2	0.1	10.5		0.0			
91								April Rehab
92	3.6	1.7	10.6					
93	2.3	0.7	12.0	14.9	41.0			Iced 100%
94	2.0	0.6	12.3	20.9	1.0	517	1,020	
95	0.2	0.1	14.4	18.3	67.0	253	68	
96	0.6	0.2	13.4	17.7	18.0	210	152	Ice cover 95%
97	0.1	0.1	none	17.3	100.0	no estimate possible		Ice cover 50%
98	1.5	0.9	9.2		0.0	368	463	October rehab

99	0.3	0.1	9-10		none	Catchable RB added (30K); Windy
00	1.2	0.2	12.0	14-16	92 ?	Yrlg-carryover sig size overlap?
01	4.7		13.0	19	3	change to late-April Opener Catchable RB added (30K) Yrlg-carryover sig size overlap
02	4.7		13.4	15+?	1-2	Catchable RB added (14K) Yrlg-carryover sig size overlap
03	2.1		14.7	18.5	1-2All	RB all fingerling origin. Yrlg-co sig size overlap 12-17"
04	3.8		11.9	16.8	8	RB all fingerling origin.
05	3.6		10.0	15.5	5	Catchable RB added (25K)
06	3.5		11.5	145-17"	8	~ 20% 9" catchables
06 proposed October Rehab						

Rehabilitations: Contamination by spiny-ray species has been the largest obstacle to managing these waters as trout fisheries. Carp and other spiny rayed fishes eventually invaded the system from Lind Coulee, and the first rehabilitation was necessary in 1966. Only one part per million was used in 1966, and the carp were not eliminated from Warden Lake. Within two years, the carp population had rebounded dramatically, and a second rehabilitation in 1969 using toxaphene was probably successful in removing the carp from the system. After each of the first two rehabilitations of this lake, anglers enjoyed a period of very good trout fishing, averaging 4-9 fish on opening day. It was 5 years after the second rehabilitation before sufficient numbers of carp re-invaded from Lind Coulee, reproduced, and over-ran the lake once more.

An outlet barrier on the outflow of Warden Lake was constructed in 1979 with financial assistance from the U.S. Bureau of Reclamation. In addition, a semi-permeable barrier was constructed blocking the inflow to Warden Lake from the Index Lakes. The third rehabilitation in April, 1980 employed 4 ppm rotenone and successfully eradicated carp from the system. Yellow perch, however, persisted. This was probably due to that species' early spawning behavior (~40 F water temperature), long incubation period (~21 days), and the inability of rotenone to kill fish in the egg stage. If large numbers of perch spawned just previous to rehabilitation, the fry would not emerge from those eggs until three weeks later. The rotenone would likely have detoxified by that time, and a large year class of perch would be available to take advantage of the lake's unclaimed food base. About three years later, the perch would mature and create an overwhelming year class followed by poor trout fry survival. The fourth rehabilitation of Warden Lake in April of 1991 suffered the same fate in-so-far as its failure to eradicate the perch. Perch eggs were actually observed during that treatment.

The fifth treatment was conducted in the fall of 1998 in order to avoid the perch spawn, and no yellow perch have been observed since. While the perch population may have been eradicated, it is possible that some small number remain. Brown bullheads and pumpkinseed sunfish have persisted and comprised an overwhelming portion (> 90%) of fish numbers and biomass in Warden Lake by 2005 (June 2005 electrofishing survey). Fisheries for these species were non-

existent at Warden Lake.

Stocking allotments: Early stocking rates for Warden Lake exceeded 500 fish per acre and still produced an 11-12 inch rainbow by opening day. Stocking rates have been reduced from the early years to about 350 fish per acre (about 70,000 rainbow fingerlings @ 80-100/lb), usually Goldendale or Spokane rainbow broodstock. Brown trout became part of the annual allotment in 1992; however, this species did little to slow down the expanding population of perch. Catchable-sized (9-10") rainbow were added to the fishery previous to opening day in 2001 and 2002; however, these additional fish failed to make a significant contribution to the catch during either year, so were discontinued. Yearling size has regularly exceeded expectations to the extent that it was difficult to separate yearlings from carry-overs, especially in 2003. Excessive yearling size has been an indication of poor fingerling survival. In 2004, size began to diminish, and in anticipation of a failed fingerling-based fishery, catchables were added previous to the 2005 opener. Almost all the rainbow checked opening day 2005 and all rainbow observed in a subsequent survey were attributed to the addition of the catchables. In 2006, fingerling survival was apparently somewhat better, and catchables were only 20% of the opening day catch. However, the catchability of the larger fingerling-based yearlings is often better than catchables newly introduced to a lake.

Avian predation: Since the late 1980's, a relatively new management issue for this water has been the increasing number of piscivorous birds frequenting the area. Cormorants have become spring breeders and summertime residents. Pelicans are also frequent summertime residents on Warden Lake, and mergansers are primarily winter predators. While no uncontested proof of damage to the fishery exists, these species are primarily fish eaters. It is suspected that many of the unpredictable and unexplainable failures of the fisheries, which occur periodically in the Seep Lakes Area, including Warden Lake, could be attributable to these avian species.

During the last five or six years, large numbers of cormorants (100's) and pelicans (dozens) have been frequently observed feeding at the lake through spring and into mid-summer. Fish species consumed are unknown, and the impact to fingerling rainbow remains unquantified; however, even an average of 20 cormorants each consuming 2 lbs per day could remove 36,000 rainbow fingerlings (@ 30/lb avg.) per month. The stocking allotment for Warden Lake is only 70,000 rainbow trout.

T&E Flora and Fauna: Professionals from many resource fields have visited this site countless times during the last 40 years. No known report exists of any threatened or endangered species habitually found in or near these lakes. Double-crested cormorants, discussed above, are spring to fall visitors, although all known nesting occurs on Potholes Reservoir. Occasional visits from both bald and golden eagles occur, and no nests of these two species are known in the area. Protected species of waterfowl and other birds frequently are found here at times, as well.

Current Management Objectives: Warden and South Warden Lakes

Last Saturday in April through September 30, production type trout fishery. Five fish limit, no size or gear restrictions. Provide 4+ yearling 12 inch rainbow trout per angler trip for 1,000 anglers on opening day, and 3 trout per angler for the remaining part of the season for at least 3,000 additional angler trips. Warden Lake could sustain well over 10,000 angler trips per year.

1. Fishery Objectives:

<u>Species</u>	<u>Type</u>	<u>Category</u>	<u>Number of Fish</u>		<u>Avg.Size</u>	<u>Exploit.</u>
			<u>/hour</u>	<u>/Angler</u>		<u>Rate</u>
Rainbow	Prod	Opening Day	2-3	4	11 inches	90% 1-yr-olds
		Season Average	1-2	3	12-14 inches	90% 1-yr-olds

2. Angler use objective (# angler days): Season - 4,000 minimum; up to 12,000.

3. Stocking Objectives:

<u>Lake</u>	<u>Species</u>	<u>Number of Fish Stocked</u>			<u>Planting Month</u>
		<u>Total</u>	<u>/Acre</u>	<u>/pound</u>	
Warden	Rainbow	70,000	310	<80	May
	Brown Trout	10,000	50	<80	May
South	Rainbow	8,000	320	<80	March
Warden	Brown Trout	1,300	50	<80	May

E. Management Strategy:

- Plant rainbow fry in spring.
- Check yearling growth; should be about 11 inches, adjust stocking rate as necessary.
- Harvest 90% of yearling fish by end of season.
- Monitor all fish species periodically by electrofishing or netting.
- Substitute fall fingerlings for at least a portion of the spring fry when competing species begin to impact trout fry survival.
- Control spiny-ray species with rotenone when trout survival is inadequate to produce an acceptable fishery.
- Manage the Annex Lakes as low key, walk-in fisheries on a year around season consistent with the landowners' desires. Stocking rates 100-200 rainbow and/or brown trout per acre.